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ABSTRACT

This publication answers questions about the consequences of abusing commonly prescribed medications including opioids, central nervous system depressants, and stimulants. In addition to offering information on what research says about how certain medications affect the brain and body, this publication also discusses treatment options. It examines prescription drug abuse in older adults as well as in adolescents and young adults, and discusses sex differences in this abuse. The roles of health care providers, pharmacists, and patients in the prevention and detection of prescription drug abuse are presented. This publication was developed to help health care providers discuss the consequences of prescription drug abuse with their patients. According to a recent national survey of primary care physicians and patients regarding substance abuse, 46.6% of physicians find it difficult to discuss prescription drug abuse with their patients. (MKA)

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National Institute on Drug Abuse
Research Report Series

Prescription Drugs: Abuse and Addiction

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NATIONAL INSTITUTE ON DRUG ABUSE

Research Report SERIES

PRESCRIPTION DRUGS *Abuse and Addiction*

from the director

Most people who take prescription medications take them responsibly; however, the nonmedical use or abuse of prescription drugs remains a serious public health concern. Certain prescription drugs—opioids, central nervous system (CNS) depressants, and stimulants—when abused, can alter the brain's activity and lead to dependence and possibly addiction.

An estimated 4 million people aged 12 and older used prescription drugs for nonmedical reasons in 1999; almost half of that number reported using prescription drugs nonmedically for the first time in the previous year. We would like to reverse this trend by increasing awareness and promoting additional research on this topic.

The National Institute on Drug Abuse (NIDA) has developed this publication to answer questions about the consequences of abusing commonly prescribed medications. In addition to offering information on what research has taught us about how certain medications affect the brain and body, this publication also discusses treatment options.

This publication was developed to help health care providers discuss the consequences of prescription drug abuse with their patients. According to a recent national survey of primary care physicians and patients regarding substance abuse, 46.6 percent of physicians find it difficult to discuss prescription drug abuse with their patients.

Prescription drug abuse is not a new problem, but one that deserves renewed attention. We hope this scientific report is useful to the public, particularly to individuals working with the elderly, who because of the number of medications they may take for various medical conditions, may be more vulnerable to misuse or abuse of prescribed medications.

Alan I. Leshner, Ph.D.
Director
National Institute on Drug Abuse

What are some of the commonly abused prescription drugs?

Although many prescription drugs can be abused or misused, there are three classes of prescription drugs that are most commonly abused:

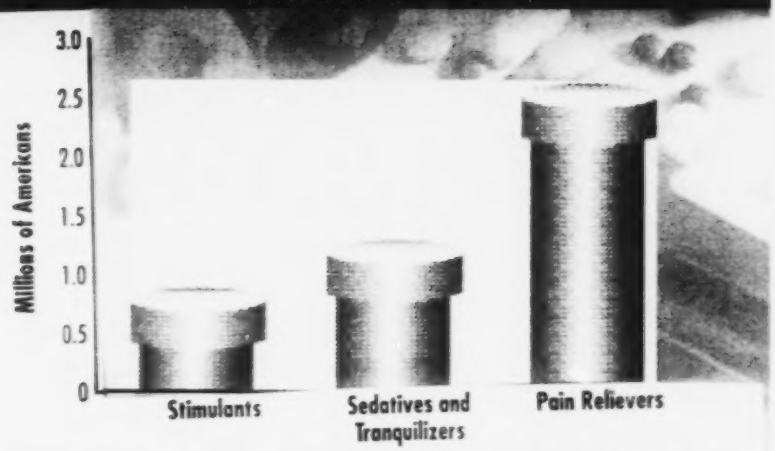
- **Opioids**, which are most often prescribed to treat pain;
- **CNS depressants**, which are used to treat anxiety and sleep disorders;
- **Stimulants**, which are prescribed to treat the sleep disorder narcolepsy, attention-deficit hyperactivity disorder (ADHD), and obesity.

Opioids

What are opioids?

Opioids are commonly prescribed because of their effective analgesic, or pain-relieving, properties. Medications that fall within this class—sometimes referred to as narcotics—include morphine, codeine, and related drugs. Morphine, for example, is often used before or after surgery to alleviate severe pain. Codeine, because it is less efficacious than morphine, is used for milder pain. Other examples of opioids that can be prescribed to alleviate pain include oxycodone (OxyContin), propoxyphene (Darvon), hydrocodone (Vicodin), and hydromorphone (Dilaudid),

Approximately 4 Million Americans Used Prescription Drugs for Nonmedical Purposes in 1999



Source: Office of Applied Studies, Substance Abuse and Mental Health Services Administration. National Household Survey on Drug Abuse. 1999.

as well as meperidine (Demerol), which is used less often because of its side effects. In addition to their pain-relieving properties, some of these drugs—for example, codeine and diphenoxylate (Lomotil)—can be used to relieve coughs and diarrhea.

How do opioids affect the brain and body?

Opioids act by attaching to specific proteins called opioid receptors, which are found in the brain, spinal cord, and gastrointestinal tract. When these drugs attach to certain opioid receptors, they can block the transmission of pain messages to the brain. In addition, opioids can produce drowsiness, cause constipation, and, depending upon the amount of drug taken, depress respiration. Opioid drugs also can cause euphoria by affecting the brain regions that mediate what we perceive as pleasure.

What are the possible consequences of opioid use and abuse?

Chronic use of opioids can result in tolerance for the drugs, which means that users must take higher doses to achieve the same initial effects. Long-term use also can lead to physical dependence and addiction—the body adapts to the presence of the drug, and withdrawal symptoms occur if use is reduced or stopped. Symptoms of withdrawal include restlessness, muscle and bone pain, insomnia, diarrhea, vomiting, cold flashes with goose bumps ("cold turkey"), and involuntary leg movements. Finally, taking a large single dose of an opioid could cause severe respiratory depression that can lead to death. Many studies have shown, however, that properly managed medical use of opioid analgesic drugs is safe and rarely causes clinical addiction, defined as compulsive, often uncontrollable use of drugs. Taken exactly as prescribed, opioids can be used to manage pain effectively.

Is it safe to use opioid drugs with other medications?

Opioids are safe to use with other drugs only under a physician's supervision. Typically, they should not be used with other substances that depress the central nervous system, such as alcohol, antihistamines, barbiturates, benzodiazepines, or general anesthetics, as such a combination increases the risk of life-threatening respiratory depression.

CNS depressants

What are CNS depressants?

CNS depressants are substances that can slow normal brain function. Because of this property, some CNS depressants are useful in the treatment of anxiety and sleep disorders. Among the medications that are commonly

prescribed for these purposes are the following:

- **Barbiturates**, such as mephobarbital (Mebaral) and pentobarbital sodium (Nembutal), which are used to treat anxiety, tension, and sleep disorders.
- **Benzodiazepines**, such as diazepam (Valium), chlordiazepoxide HCl (Librium), and alprazolam (Xanax), which can be prescribed to treat anxiety, acute stress reactions, and panic attacks; the more sedating benzodiazepines, such as triazolam (Halcion) and estazolam (ProSom) can be prescribed for short-term treatment of sleep disorders.

In higher doses, some CNS depressants can be used as general anesthetics.

How do CNS depressants affect the brain and body?

There are numerous CNS depressants; most act on the brain by affecting the neurotransmitter gamma-aminobutyric acid (GABA). Neurotransmitters are brain chemicals that facilitate communication between brain cells. GABA works by decreasing brain activity. Although the different classes of CNS depressants work in unique ways, ultimately it is through their ability to increase GABA activity that they produce a drowsy or calming effect that is beneficial to those suffering from anxiety or sleep disorders.

What are the possible consequences of CNS depressant use and abuse?

Despite their many beneficial effects, barbiturates and benzodiazepines have the potential for abuse and should be used only as prescribed. During the first few days of taking a prescribed CNS depressant, a person usually feels sleepy and uncoordinated, but as the body becomes accustomed to the effects of the drug, these feelings begin to disappear. If one uses these drugs long term, the body will develop tolerance for the drugs, and larger doses will be needed to achieve the same initial effects. In addition, continued use can lead to physical dependence and—when use is reduced or stopped—withdrawal. Because all CNS depressants work by slowing the brain's activity, when an individual stops taking them, the brain's activity can rebound and race out of control, possibly leading to seizures and other harmful consequences. Although withdrawal from benzodiazepines can be problematic, it is rarely life threatening, whereas withdrawal from prolonged use of other CNS depressants can have life-threatening complications. Therefore, someone who is thinking about discontinuing CNS-depressant therapy or who is suffering withdrawal from a CNS depressant should speak with a physician or seek medical treatment.

Is it safe to use CNS depressants with other medications?

CNS depressants should be used with other medications only under a physician's supervision. Typically, they should not be combined with any other medication or substance that causes CNS depression, including prescription pain medicines, some over-the-counter cold and allergy medications, or alcohol. Using CNS depressants with these other substances—particularly alcohol—can slow breathing, or slow both the heart and respiration, and possibly lead to death.

Stimulants

What are stimulants?

As the name suggests, stimulants are a class of drugs that enhance brain activity—they cause an increase in alertness, attention, and energy that is accompanied by elevated blood pressure and increased heart rate and respiration. Stimulants were used historically to treat asthma and other respiratory problems, obesity, neurological disorders, and a variety of other ailments. But as their potential for abuse and addiction became apparent, the medical use of stimulants began to wane. Now, stimulants

are prescribed for the treatment of only a few health conditions, including narcolepsy, attention-deficit hyperactivity disorder, and depression that has not responded to other treatments. Stimulants may be used as appetite suppressants for short-term treatment of obesity, and they also may be used for patients with asthma who do not respond to other medications.

How do stimulants affect the brain and body?

Stimulants, such as dextroamphetamine (Dexedrine) and methylphenidate (Ritalin), have chemical structures that are similar to a family of key brain neurotransmitters called monoamines, which include norepinephrine and dopamine. Stimulants increase the amount of these chemicals in the brain. This, in turn, increases blood pressure and heart rate, constricts blood vessels, increases blood glucose, and opens up the pathways of the respiratory system. In addition, the increase in dopamine is associated with a sense of euphoria that can accompany the use of these drugs.

What are the possible consequences of stimulant use and abuse?

The consequences of stimulant abuse can be dangerous. Although their use may not lead to physical dependence and risk of withdrawal, stimulants can be addictive in that individuals begin to use them compulsively. Taking high doses of some stimulants repeatedly over a short time can lead to feelings of hostility or paranoia. Additionally, taking high doses of a stimulant may result in dangerously high body temperatures and an irregular heartbeat. There is also the potential for cardiovascular failure or lethal seizures.

Is it safe to use stimulants with other medications?

Stimulants should be used with other medications only when the patient is under a physician's supervision. For example, a stimulant may be prescribed to a patient taking an antidepressant. However, health care providers and patients should be mindful that antidepressants enhance the effects of a stimulant. Patients also should be aware that stimulants should not be mixed with over-the-counter cold medicines that contain decongestants, as this combination may cause blood pressure to become dangerously high or lead to irregular heart rhythms.

Trends in prescription drug abuse

Prescription drug abuse is on the rise in the United States. According to the 1999 National Household Survey on Drug Abuse, in 1998, an estimated 1.6 million Americans used prescription pain relievers nonmedically for the first time. This represents a significant increase since the 1980s, when there were generally fewer than 500,000 first-time users per year. From 1990 to 1998, the number of new users of pain relievers increased by 181 percent; the number of individuals who initiated tranquilizer use increased by 132 percent; the number of new sedative users increased by 90 percent; and the number of people initiating stimulant use increased by 165 percent. In total, in 1999, an estimated 4 million people—almost 2 percent of the population aged 12 and older—were using certain prescription drugs nonmedically: pain relievers (2.6 million users), sedatives and tranquilizers (1.3 million users), and stimulants (0.9 million users).

Although prescription drug abuse affects many Americans, some trends of concern can be seen among older adults, adolescents, and women. In addition, health care professionals—including physicians, nurses, pharmacists, dentists, anesthesiologists, and veterinarians—may be at increased risk of prescription drug abuse because of ease of access, as well as their ability to self-prescribe drugs. In spite of this increased risk, recent surveys and research in the early 1990s indicate that health care providers probably suffer from substance abuse, including

Some Commonly Prescribed Medications: Use and Consequences

OPIOIDS (Morphine Derivatives)

- Oxycodone (OxyContin)
- Propoxyphene (Darvon)
- Hydrocodone (Vicodin)
- Hydromorphone (Dilaudid)
- Meperidine (Demerol)
- Diphenoxylate (Lomotil)

Generally prescribed for

- Postsurgical pain relief
- Management of acute or chronic pain
- Relief of coughs and diarrhea

In the body

Opioids attach to opioid receptors in the brain and spinal cord, blocking the transmission of pain messages to the brain.

Effects of short-term use

- Blocked pain messages
- Drowsiness
- Constipation
- Depressed respiration (depending on dose)

Effects of long-term use

- Potential for tolerance, physical dependence, withdrawal, and/or addiction

Possible negative effects

- Severe respiratory depression or death following a large single dose

Should not be used with

Other substances that cause CNS depression, including

- Alcohol
- Antihistamines
- Barbiturates
- Benzodiazepines
- General anesthetics

CNS DEPRESSANTS

Barbiturates

- Mephobarbital (Mebaral)
- Pentobarbital sodium (Nembutal)

Benzodiazepines

- Diazepam (Valium)
- Chlordiazepoxide hydrochloride (Librium)
- Alprazolam (Xanax)
- Triazolam (Halcion)
- Estazolam (ProSom)

Generally prescribed for

- Anxiety
- Tension
- Panic attacks
- Acute stress reactions
- Sleep disorders
- Anesthesia (at high doses)

In the body

CNS depressants slow brain activity through actions on the GABA system and, therefore, produce a calming effect.

Effects of short-term use

- A "sleepy" and uncoordinated feeling during the first few days, as the body becomes accustomed—tolerant—to the effects, these feelings diminish.

Effects of long-term use

- Potential for tolerance, physical dependence, withdrawal, and/or addiction

Possible negative effects

- Seizures following a rebound in brain activity after reducing or discontinuing use

Should not be used with

Other substances that cause CNS depression, including

- Alcohol
- Prescription opioid pain medicines
- Some over-the-counter cold and allergy medications

STIMULANTS

- Dextroamphetamine (Dexedrine)
- Methylphenidate (Ritalin)
- Sibutramine hydrochloride monohydrate (Meridia)

Generally prescribed for

- Narcolepsy
- Attention-deficit hyperactivity disorder (ADHD)
- Depression that does not respond to other treatment
- Short-term treatment of obesity
- Asthma that does not respond to other treatment

In the body

Stimulants enhance brain activity, causing an increase in alertness, attention, and energy.

Effects of short-term use

- Elevated blood pressure
- Increased heart rate
- Increased respiration
- Suppressed appetite
- Sleep deprivation

Effects of long-term use

- Potential for addiction

Possible negative effects

- Dangerously high body temperatures or an irregular heartbeat after taking high doses
- Cardiovascular failure or lethal seizures
- For some stimulants, hostility or feelings of paranoia after taking high doses repeatedly over a short period of time

Should not be used with

- Over-the-counter cold medicines containing decongestants
- Antidepressants, unless supervised by a physician
- Some asthma medications

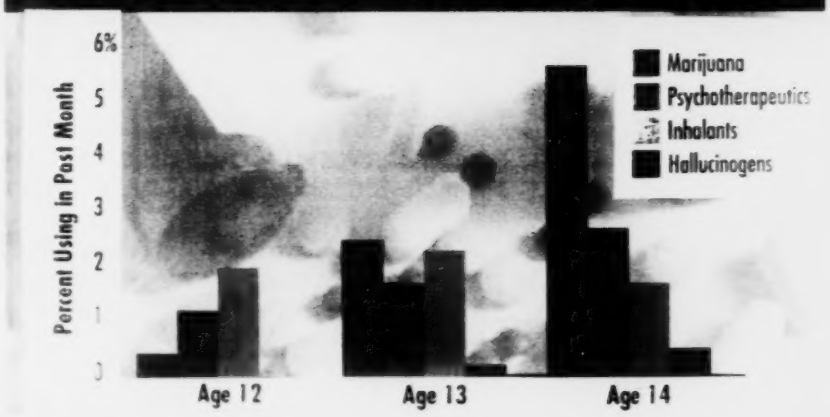
alcohol and drugs, at a rate similar to rates in society as a whole, in the range of 8 to 12 percent.

Older adults

Data suggest that up to 17 percent of adults aged 60 or older may be affected by prescription drug abuse. Elderly persons use prescription medications approximately three times as frequently as the general population and have been found to have the poorest rates of compliance with directions for taking a medication. In addition, data from the Veterans Affairs Hospital System suggest that elderly patients may be prescribed inappropriately high doses of medications such as benzodiazepines and may be prescribed these medications for longer periods than are younger adults. In general, older people should be prescribed lower doses of medications, because the body's ability to metabolize many medications decreases with age.

An association between age-related morbidity and abuse of prescription medications likely exists. For example, elderly persons who take benzodiazepines are at increased risk for falls that cause hip and thigh fractures, as well as for vehicle accidents. Cognitive impairment also is associated with benzodiazepine use, although memory impairment may be reversible when the drug is discontinued. Finally, use of benzodiazepines for longer than 4 months is not recommended for elderly patients because of the possibility of physical dependence.

Illicit Drug Use Among Youths Age 12 to 14



Source: Office of Applied Studies, Substance Abuse and Mental Health Services Administration, National Household Survey on Drug Abuse, 1999.

Adolescents and young adults

Data from the National Household Survey on Drug Abuse indicate that the most dramatic increase in new users of prescription drugs for nonmedical purposes occurs in 12- to 17-year-olds and 18- to 25-year-olds. In addition, 12- to 14-year-olds reported psychotherapeutics (for example, painkillers or stimulants) as one of two primary drugs used. The 1999 Monitoring the Future Survey showed that for barbiturates, tranquilizers, and narcotics other than heroin, the general, long-term declines in use among young adults in the 1980s leveled off in the early 1990s, with modest increases again in the mid-to late 1990s. For example, the use of methylphenidate (Ritalin) among adolescents and young adults increased from an annual prevalence (use of the drug within the preceding year) of 0.1 percent in 1992 to an annual prevalence of 2.8 percent in 1997 before reaching a plateau. According to a recent survey by the University of Wisconsin, one in five students had used Ritalin nonmedically.

It also appears that college students' nonmedical use of pain relievers such as oxycodone with aspirin (Percodan) and hydrocodone (Vicodin) is on the rise. The 1999 Drug Abuse Warning Network, which collects data on drug-related episodes in hospital

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emergency departments, reported that mentions of hydrocodone as a cause for visiting an emergency room increased by 37 percent among all age groups from 1997 to 1999. Mentions of the benzodiazepine clonazepam (Klonopin) increased by 102 percent since 1992.

Gender differences

Studies suggest that women are more likely than men to use an abusable prescription drug, particularly narcotics and anti-anxiety drugs—in some cases 48 percent more likely. This may be in part because women are two to three times more likely to be diagnosed with depression and thus are more often treated with psychotherapeutic drugs.

Overall, men and women have roughly similar rates of nonmedical use of prescription drugs. An exception is found among 12- to 17-year-olds: In this age group, young women are more likely than young men to use psychotherapeutic drugs nonmedically. In addition, research has shown that women and men who use prescription opioids are equally likely to become addicted. However, among women and men who use sedatives, anti-anxiety drugs, and hypnotics, women are almost two times more likely to become addicted.

Preventing and detecting prescription drug abuse

Although most patients use medications as directed, abuse of and addiction to prescription drugs are public health problems for many Americans. However, addiction rarely occurs among those who use pain relievers, CNS depressants, or stimulants as prescribed; the risk for addiction exists when these medications are used in ways other than as prescribed. Health care providers such as primary care physicians, nurse practitioners, and pharmacists as well as patients can all play a role in preventing and detecting prescription drug abuse.

Role of health care providers

About 70 percent of Americans—approximately 191 million people—visit a health care provider, such as a primary care physician, at least once every 2 years. Thus, health care providers are in a unique position not only to prescribe needed medications appropriately, but also to identify prescription drug abuse when it exists and help the patient recognize the problem, set goals for recovery, and seek appropriate treatment when necessary. Screening for any type of substance abuse can be incorporated into routine history taking with questions about what prescriptions and over-the-counter medicines the patient is taking and why. Screening also can be performed if a patient presents with specific symptoms associated with problem use of a substance.

Assessing Prescription Drug Abuse: Four Simple Questions for You and Your Physician

- Have you ever felt the need to **C**ut down on your use of prescription drugs?
- Have you ever felt **A**nnoyed by remarks your friends or loved ones made about your use of prescription drugs?
- Have you ever felt **G**uilty or remorseful about your use of prescription drugs?
- Have you **E**ver used prescription drugs as a way to "get going" or to "calm down?"

Adapted from Ewing, J.A. "Detecting Alcoholism: The CAGE Questionnaire." *Journal of the American Medical Association* 252(14):1905-1907, 1984.

Pain and Opiophobia

It is estimated that more than 50 million Americans suffer from chronic pain. When treating pain, health care providers have long wrestled with a dilemma: How to adequately relieve a patient's suffering while avoiding the potential for that patient to become addicted to pain medication?

Many health care providers underprescribe painkillers because they overestimate the potential for patients to become addicted to medications such as morphine and codeine. Although these drugs carry a heightened risk of addiction, research has shown that providers' concerns that patients will become addicted to pain medication are largely unfounded. This fear of prescribing opioid pain medications is known as "opiophobia."

Most patients who are prescribed opioids for pain, even those undergoing long-term therapy, do not become addicted to the drugs. The few patients who do develop rapid and marked tolerance for and addiction to opioids usually have a history of psychological problems or prior substance abuse. In fact, studies have shown that abuse potential of opioid medications is generally low in healthy, non-drug-abusing volunteers. One study found that only 4 out of more than 12,000 patients who were given opioids for acute pain became addicted. In a study of 38 chronic pain patients, most of whom received opioids for 4 to 7 years, only 2 patients became addicted, and both had a history of drug abuse.

The issues of underprescription of opioids and the suffering of millions of patients who do not receive adequate pain relief has led to the development of guidelines for pain treatment. These guidelines may help bring an end to underprescribing, but alternative forms of pain control are still needed. NIDA-funded scientists continue to search for new ways to control pain and to develop new pain medications that are effective but do not have the potential for addiction.

Over time, providers should note any rapid increases in the amount of a medication needed—which may indicate the development of tolerance—or frequent requests for refills before the quantity prescribed should have been used. They should also be alert to the fact that those addicted to prescription medications may engage in "doctor shopping," moving from provider to provider in an effort to get multiple prescriptions for the drug they abuse.

Preventing or stopping prescription drug abuse is an important part of patient care. However, health care providers should not avoid prescribing or administering strong CNS depressants and painkillers, if they are needed. (See box on pain and opiophobia.)

Role of pharmacists

Pharmacists can play a key role in preventing prescription drug misuse and abuse by providing clear information and advice about how to take a medication appropriately, about the effects the medication may have, and about any possible drug interactions. Pharmacists can help prevent prescription fraud or diversion by looking for false or altered prescription forms. Many pharmacies have developed "hotlines" to alert other pharmacies in the region when a fraud is detected.

Role of patients

There are several ways that patients can prevent prescription drug abuse. When visiting the doctor, provide a complete

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medical history and a description of the reason for the visit to ensure that the doctor understands the complaint and can prescribe appropriate medication. If a doctor prescribes a pain medication, stimulant, or CNS depressant, follow the directions for use carefully and learn about the effects that the drug could have, especially during the first few days during which the body is adapting to the medication. Also be aware of potential interactions with other drugs by reading all information provided by the pharmacist. Do not increase or decrease doses or abruptly stop taking a prescription without consulting a health care provider first. For example, if you are taking a pain reliever for chronic pain and the medication no longer seems to be effectively controlling the pain, speak with your physician; do not increase the dose on your own. Finally, never use another person's prescription.

Treating prescription drug addiction

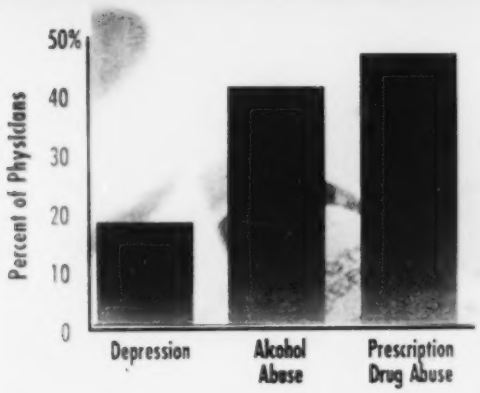
Years of research have shown us that addiction to any drug, illicit or prescribed, is a brain disease that can, like other chronic diseases, be effectively treated. But no single type of treatment is appropriate for all individuals addicted to prescription drugs. Treatment must take into account the type of drug used and the needs of the individual. To be successful, treatment may need to incorporate several components, such as counseling in conjunction with a prescribed medication, and multiple courses of treatment may be needed for the patient to make a full recovery.

The two main categories of drug addiction treatment are behavioral and pharmacological. Behavioral treatments teach people how to function without drugs, how to handle cravings, how to avoid drugs and situations that could lead to drug use, how to prevent relapse, and how to handle relapse should it occur. When delivered effectively, behavioral treatments—such as individual counseling, group or family counseling, contingency management, and cognitive-behavioral therapies—also can help patients improve their personal relationships and ability to function at work and in the community.

Some addictions, such as opioid addiction, can also be treated with medications. These pharmacological treatments counter the effects of the drug on the brain and behavior. Medications also can be used to relieve the symptoms of withdrawal, to treat an overdose, or to help overcome drug cravings.

Although a behavioral or pharmacological approach alone may be effective for treating drug addiction, research shows that a combination of both, when available, is most effective.

Many Physicians Have Difficulty Discussing Substance Abuse With Patients



Over 40% of physicians report having difficulty discussing substance abuse, including abuse of prescription drugs, with their patients. In contrast, less than 20% have difficulty discussing depression.

National Center on Addiction and Substance Abuse at Columbia University (CASA). Missed Opportunity: National Survey of Primary Care Physicians and Patients on Substance Abuse. New York: CASA, 2000.

Treating addiction to prescription opioids

Several options are available for effectively treating addiction to prescription opioids. These options are drawn from experience and research regarding the treatment of heroin addiction. They include medications, such as methadone and LAAM (levo-alpha-acetyl-methadol), and behavioral counseling approaches.

A useful precursor to long-term treatment of opioid addiction is detoxification. Detoxification in itself is not a treatment for opioid addiction. Rather, its primary objective is to relieve withdrawal symptoms while the patient adjusts to being drug free. To be effective, detoxification must precede long-term treatment that either requires complete abstinence or incorporates a medication, such as methadone, into the treatment plan.

Methadone is a synthetic opioid that blocks the effects of heroin and other opioids, eliminates withdrawal symptoms, and relieves drug craving. It has been used successfully for more than 30 years to treat people addicted to opioids. Other medications include LAAM, an alternative to methadone that blocks the effects of opioids for up to 72 hours, and naltrexone, an opioid blocker that is often employed for highly motivated individuals in treatment programs promoting complete abstinence. Buprenorphine, another effective medication, is awaiting Food and Drug Administration (FDA) approval for treatment of opioid addiction. Finally, naloxone, which counteracts the effects of opioids, is used to treat overdoses.

Treating addiction to CNS depressants

Patients addicted to barbiturates and benzodiazepines should not attempt to stop taking them on their own, as withdrawal from these drugs can be problematic, and in the case of certain CNS depressants, potentially life-threatening. Although no extensive body of research regarding the treatment of barbiturate and benzodiazepine addiction exists, patients addicted to these medications should undergo medically supervised detoxification because the dose must be gradually tapered off. Inpatient or outpatient counseling can help the individual during this process. Cognitive-behavioral therapy also has been used successfully to help individuals adapt to the removal from benzodiazepines.

Often the abuse of barbiturates and benzodiazepines occurs in conjunction with the abuse of another substance or drug, such as alcohol or cocaine. In these cases of polydrug abuse, the treatment approach must address the multiple addictions.

Treating addiction to prescription stimulants

Treatment of addiction to prescription stimulants, such as Ritalin, is often based on behavioral therapies proven effective for treating cocaine or methamphetamine addiction. At this time, there are no proven medications for the treatment of stimulant addiction. However, antidepressants may help manage the symptoms of depression that can accompany the early days of abstinence from stimulants.

Depending on the patient's situation, the first steps in treating prescription stimulant addiction may be tapering off the drug's dose and attempting to treat withdrawal symptoms. The detoxification process could then be followed by one of many behavioral therapies. Contingency management, for example, uses a system that enables patients to earn vouchers for drug-free urine tests. The vouchers can be exchanged for items that promote healthy living.

Another behavioral approach is cognitive-behavioral intervention, which focuses on modifying the patient's thinking, expectations, and behaviors while at the same time increasing skills for coping with various life stressors.

Recovery support groups may also be effective in conjunction with behavioral therapy.

Glossary

Addiction: A chronic, relapsing disease, characterized by compulsive drug seeking and use and by neurochemical and molecular changes in the brain.

Barbiturate: A type of central nervous system (CNS) depressant often prescribed to promote sleep.

Benzodiazepine: A type of CNS depressant prescribed to relieve anxiety; among the most widely prescribed medications, including Valium and Librium.

Buprenorphine: A new medication awaiting FDA approval for treatment of opiate addiction. It blocks the effects of opioids on the brain.

Central nervous system (CNS): The brain and spinal cord.

CNS depressants: A class of drugs that slow CNS function, some of which are used to treat anxiety and sleeping disorders; includes barbiturates and benzodiazepines.

Detoxification: A process that allows the body to rid itself of a drug while at the same time managing the individual's symptoms of withdrawal; often the first step in a drug treatment program.

Dopamine: A neurotransmitter present in regions of the brain that regulate movement, emotion, motivation, and feelings of pleasure.

LAAM (levo-alpha-acetyl-methadol): An approved medication for the treatment of opiate addiction, taken 3 to 4 times a week.

Methadone: A long-acting synthetic medication that is effective in treating opiate addiction.

Narcolepsy: A disorder characterized by uncontrollable episodes of deep sleep.

Norepinephrine: A neurotransmitter present in some areas of the brain and the adrenal glands; decreases smooth muscle contraction and increases heart rate; often released in response to low blood pressure or stress.

Opioids: Controlled drugs or narcotics most often prescribed for the management of pain; natural or synthetic chemicals based on opium's active component—morphine—that work by mimicking the actions of pain-relieving chemicals produced in the body.

Opiophobia: A health care provider's unfounded fear that patients will become physically dependent upon or addicted to opioids even when using them appropriately; can lead to the underprescribing of opioids for pain management.

Physical dependence: An adaptive physiological state that can occur with regular drug use and results in withdrawal when drug use is discontinued.

Polydrug abuse: The abuse of two or more drugs at the same time, such as CNS depressant abuse accompanied by abuse of alcohol.

Prescription drug abuse: The intentional misuse of a medication outside of the normally accepted standards of its use.

Prescription drug misuse: Taking a medication in a manner other than that prescribed or for a different condition than that for which the medication is prescribed.

Psychotherapeutics: Drugs that have an effect on the function of the brain and that often are used to treat psychiatric disorders; can include opioids, CNS depressants, and stimulants.

Respiratory depression: Depression of respiration (breathing) that results in the reduced availability of oxygen to vital organs.

Stimulants: Drugs that enhance the activity of the brain and lead to increased heart rate, blood pressure, and respiration; used to treat only a few disorders, such as narcolepsy and attention-deficit hyperactivity disorder.

Tolerance: A condition in which higher doses of a drug are required to produce the same effect as experienced initially.

Tranquilizers: Drugs prescribed to promote sleep or reduce anxiety; this National Household Survey on Drug Abuse classification includes benzodiazepines, barbiturates, and other types of CNS depressants.

Withdrawal: A variety of symptoms that occur after chronic use of some drugs is reduced or stopped.

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- **Information on prescription drugs and other drugs of abuse**
- **Publications and communications (including NIDA NOTES)**
- **Calendar of events**
- **Links to NIDA organizational units**
- **Funding information (including program announcements and deadlines)**
- **International activities**
- **Links to related Web sites (access to Web sites of many other organizations in the field)**

NIDA Web Sites
www.drugabuse.gov
www.steroidabuse.org
www.clubdrugs.org

National Clearinghouse for Alcohol and Drug Information (NCADI)
Web Site: www.health.org
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